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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,077	06/22/2006	Kiminori Mizuuchi	2006_1008A	8768

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EXAMINER	
VAN ROY, TOD THOMAS	
ART UNIT	PAPER NUMBER
2828	
MAIL DATE	DELIVERY MODE
11/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,077	MIZUUCHI ET AL.	
	Examiner	Art Unit	
	TOD T. VAN ROY	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/19/06,10/24/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 details the resistance value of the electrode layer varies, while the disclosure teaches the resistance value to vary via the use of a coating applied on one side of the electrode. Clarification is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6, 17, and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu (JP 11-233889, Applicant submitted prior art).

With respect to claim 1, Shimizu discloses a surface emitting semiconductor laser comprising: an active layer (fig.3 #13) disposed on a semiconductor substrate (fig.3 #21), and a pair of electrodes for injecting current into the active layer (fig.3 #s 16/18), wherein one of said electrodes comprises a single electrode layer (fig.3 #16, single layer separated by holes), and injection of current from said one electrode into the active layer is carried out with different current densities for a center portion of said one electrode and for a peripheral portion thereof (fig.3 shape of #16, [0019]).

With respect to claim 2, Shimizu discloses a semiconductor layer body (fig.3) including the active layer, wherein the area density in a region where the electrode layer contacts the semiconductor layer laminated body differs between the center portion of the electrode layer and the periphery portion thereof (due to shape).

The "laminating" limitations are rejected for the same reasons as claim 1. These limitations merely detail the methods of forming the device. The method of forming a device is not germane to the patentability of the device itself, therefore these limitations are not given patentable weight. At best this could be characterized as product-by-

process limitation, where the process limitations are not limiting, only the structure implied by the process. See MPEP 2113. Here, the structure implied by the process steps is merely the structure of claim 1.

With respect to claim 3, Shimizu discloses plural fine holes are formed in the electrode layer constituting said one electrode so that the occupation density of the fine holes differs between the center portion of said one electrode and the peripheral portion thereof (fig.3, one hole near to the center, two holes near the periphery).

With respect to claim 6, Shimizu further discloses a resonator for amplifying the light in the active layer (inherent), said resonator comprising a reflection layer included in the semiconductor body (fig.3 #14), and an external mirror disposed separately from the body ([0036]).

With respect to claim 17, the laser of Shimizu can be considered a laser projector in and of itself.

With respect to claims 20 and 23, Shimizu discloses the laser of claim 1, and further discloses an RF signal (a modulated signal) applied to the plural (fig.3 #16 can be interpreted as one electrode with multiple holes as in claim 1, or plural electrodes as is done herein) electrode ([0038]).

With respect to claim 21, Shimizu discloses the plural electrodes are arranged substantially uniformly around the emission center of the laser light (fig.3).

With respect to claims 22 and 24, Shimizu discloses the injection of current from each electrode part to the active layer is carried out so that the current density

increases toward a region near the emission center of the active layer (fig.3 shape of #16, [0019]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 7, 9-11, 15-16, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu.

Shimizu does not disclose the particular mirror shape of claim 7. However these mirrors are well known in the art. The particular mirror shape used in Shimizu does not appear critical to the operation of the device, therefore it would have been obvious to one skilled in the art to substitute the known mirror into the system of Shimizu by an obvious engineering design choice.

With respect to claims 9-11, Shimizu teaches the device outlined above, but does not teach the stated wavelength ranges. It would have been obvious to one of ordinary

skill in the art at the time of the invention to change the active material of Shimizu to emit at different wavelengths in order to obtain needed frequency outputs for communications use.

With respect to claims 15-16, Shimizu teaches one laser, not multiple devices. It would have been obvious to one of ordinary skill in the art at the time of the invention to add additionally devices of Shimizu into a polygonal output arrangement to increase the amount of power output and achieve a desired beam profile.

With respect to claims 18-19, Shimizu teaches the device outlined above, but does not teach a multimode device with a 1nm vertical mode spectrum. Shimizu does teach adjustment of the external mirror ([0036]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the mirror adjustment of Shimizu with the ability to operate in multimodes with a defined profile, as it is known that cavity length adjustment affects these properties and would allow for desired output characteristics to fit a given application.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Scott et al. (US 5343487).

With respect to claim 5, Shimizu teaches the device outlined above, but does not teach the use of a resistive layer which differs based on the distance to the center of the emitting region. Scott teaches the use of resistive oxide which varies from the center of the device (fig.7). It would have been obvious to one of ordinary skill in the art at the

time of the invention to combine the device of Shimizu with the current blocking of Scott in order to better control current paths to the active region.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Marta et al. (US 5745515).

With respect to claim 8, Shimizu teaches the device outlined above, but does not teach the use of a saturation absorber layer. Marta teaches a vertical emission device which use absorber layers (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Shimizu with the absorber of Marta in order to utilize optical gating or switching (Marta, abs.).

Claims 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Mooradian (WO 98/43329, Applicant submitted prior art).

With respect to claims 12 and 14, Shimizu teaches the device outlined above, but does not teach the use of nonlinear crystals. Mooradian teaches a similar vertical emission device using a nonlinear crystal (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Shimizu with the crystal of Mooradian in order to create light of a different frequency.

Claims 13 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Iga et al. (JP 02-052485, Applicant submitted prior art).

With respect to claims 13 and 25, Shimizu teaches the device outlined above, and further teaches potential reduction of the substrate thickness ([0025]). Shimizu does not teach the substrate to have a concave portion removed. Iga teaches a vertical emission device wherein a concave portion of the substrate is removed (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device, and substrate thickness reduction teaching, of Shimizu with the concave substrate removal of Iga as a means to remove any transparency problems with the substrate material.

The "etching" limitations are rejected for the same reasons as claim 14. These limitations merely detail the methods of forming the device. The method of forming a device is not germane to the patentability of the device itself, therefore these limitations are not given patentable weight. At best this could be characterized as product-by-process limitation, where the process limitations are not limiting, only the structure implied by the process. See MPEP 2113. Here, the structure implied by the process steps is merely the structure of claim 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TVR/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828